

What is claimed is:

- 5 1. An information management system comprising:
 a plurality of workstations adapted for
 connection to a computer network, each workstation having ,
 a memory;
 a data repository arranged to receive data from
10 each of said workstations;
 an application stored in said memory of each
 workstation for transmitting outbound data to said network
 and receiving inbound data from said network;
 policy data containing rules defining relevant
15 data which is to be stored in said data repository; and
 an analyser, said analyser being operable in
 conjunction with said policy data to monitor at least one
 of said outbound data and said inbound data, to identify
20 in at least one of said outbound data and said inbound
 data, relevant data that is to be stored in said data
 repository in accordance with said rules in said policy
 data, and to cause said relevant data to be stored in said
 data repository.
- 25 2. The system of claim 1 wherein said relevant
 data that is to be stored in said data repository is
 encrypted prior to it being transmitted to said data
 repository.
- 30 3. The system of claim 1 wherein said relevant
 data that is stored in said data repository is encrypted.
4. The system of claim 1 wherein said computer
35 network, to which said one or more workstations are
 adapted for connection, is the Internet.
5. The system of claim 4 wherein said analyser is
 operable to identify, as relevant data, at least one of

usernames and passwords used to identify a user, and usernames and passwords used to access web pages on the Internet, and the URL address of the web page at which those usernames and passwords are used,

5 said identified usernames, passwords and said identified URLs being stored in said data repository.

6. The system of claim 5 wherein said analyser is operable to identify usernames and passwords from the
10 field names of data contained in at least one of said outbound data and said inbound data.

7. The system of claim 5 wherein a representation of the input fields of a web page is stored in said memory
15 of said one or more workstations, and wherein said analyser is operable to identify usernames and passwords from said representation.

8. The system of claim 5 wherein said analyser is
20 operable to identify usernames or passwords from the field types of data contained in said outbound or said inbound data.

25

9. The system of claim 4 wherein said analyser is operable to identify, as relevant data, digital certificates contained in at least one of said outbound or
30 said inbound data or used to digitally sign signed data in said inbound data or said outbound data, or sufficient descriptive data to identify such digital certificates,
 said digital certificates and/or said descriptive data being stored in said data repository.

35

10. The system of claim 9 wherein said analyser is operable to identify one or more of the following data as relevant data:

whether or not said digital certificate has been revoked;

the identity of the holder of said digital certificate;

5 the amount of any eCommerce transaction being made that is related to said digital certificate;

the goods or services being sold in any eCommerce transaction being made with said digital certificate;

10 the date of receipt of said digital certificate;

and wherein said identified data is stored with said digital certificate in said data repository.

15 11. The system of claim 4 wherein the analyser is operable to identify when an eCommerce transaction is occurring and if an eCommerce transaction is identified as occurring, to identify in said outbound or said inbound data one or more of the following data as relevant data:

20 the URL address or e-mail address of the remote location to which outbound data is being transmitted or inbound data is being received;

the web pages accessed by a user of said one or more workstations during the transaction;

25 the amount of the transaction;

the goods or services being traded in the transaction;

the date of the transaction; and

30 wherein said relevant data is stored in said data repository.

12. The system of claim 1 wherein said analyser is located on each of said one or more workstations.

35 13. The system of claim 1 wherein said application is a web browser.

14. The system of claim 13 wherein said analyser is a plug-in module of said web browser.

15. The system of claim 14 wherein said web browser is Microsoft's Internet Explorer and said analyser is a Browser Helper Object.

5

16. The system of claim 1 wherein said application is an e-mail client.

17. The system of claim 16 wherein said analyser is a plug-in module of said e-mail client.

10

18. The system of claim 17 wherein said e-mail client is Microsoft's Outlook e-mail client and said analyser is a Microsoft Exchange client extension.

15

19. The system of claim 1 wherein said network includes a server and said analyser is located at a point on said network intermediate said one or more workstations and said server, or said analyser is located at said server.

20

20. The system of claim 1 further comprising a supervisor workstation, said supervisor workstation having access to said data repository and being operable to view said relevant data stored in said data repository.

25

21. The system of claim 20 wherein said policy data is accessible by said supervisor workstation, such that a user of said supervisor workstation can edit said policy data.

30

22. The system of claim 1 wherein a workstation of said plurality of workstations has access to said data repository and is operable to view said relevant data stored in said data repository.

35

23. The system of claim 1 wherein said computer network to which said one or more workstations are adapted for connection is a public computer network, and wherein

said one or more workstations together form a private computer network.

5

24. A method of managing information comprising the steps of:

- providing a plurality of workstations adapted for connection to a computer network, each workstation
- 10 having a memory;
- providing a data repository arranged to receive data from each of said workstations;
- providing an application stored in said memory of each workstation for transmitting outbound data to said
- 15 network and receiving inbound data from said network;
- providing policy data containing rules defining relevant data which is to be stored in said data repository; and
- analysing at least one of said outbound data
- 20 and said inbound data, with reference to said policy data, to identify in at least one of said outbound data and said inbound data, relevant data that is to be stored in said data repository in accordance with said rules in said policy data; and
- 25 storing said relevant data in said data repository.

25. The method of claim 24 further comprising the step of encrypting said relevant data that is to be stored

30 in said data repository prior to it being stored in said data repository.

26. The method of claim 24 further comprising the step of encrypting said relevant data that is stored in

35 said data repository after it has been stored in said data repository.

27. The method of claim 24 wherein said computer network, to which said one or more workstations are adapted for connection, is the Internet.

5 28. The method of claim 27 wherein in the analysing step, at least one of usernames and passwords used to identify a user, and usernames and passwords used access web pages on the Internet, and the URL address of those web pages, are identified as relevant data.

10

29. The method of claim 28 wherein in said analysing step, usernames and passwords are identified from the field names of data contained in at least one of said outbound data and said inbound data.

15

30. The method of claim 28 wherein a representation of the input fields of a web page is stored in said memory of said one or more workstations, and wherein in said analysing step usernames and passwords are identified from said representation.

20

31. The method of claim 28 wherein in said analysing step usernames or passwords are identified from the field types of data contained in said outbound or said inbound data.

25

32. The method of claim 27 wherein in said analysing step, digital certificates contained in at least one of said outbound or said inbound data or used to digitally sign signed data in said inbound or said outbound data, are identified as relevant data, or sufficient descriptive data to identify such digital certificates, is identified as relevant data.

35

33. The method of claim 32 wherein said analysing step includes identifying one or more of the following data as relevant data:

whether or not said digital certificate has been revoked;

the identity of the holder of said digital certificate;

5 the amount of any eCommerce transaction being made that is related to said digital certificate;

the goods or services being sold in any eCommerce transaction being made with said digital certificate; and

10 the date of receipt of said digital certificate.

34. The method of claim 27 wherein said analysing step includes identifying when an eCommerce transaction is
15 occurring and if an on-line eCommerce transaction is identified as occurring, identifying in said outbound or said inbound data one or more of the following data as relevant data:

the URL address or e-mail address of the remote
20 location to which outbound data is being transmitted or inbound data is being received;

the web pages accessed by a user of said one or more workstations during the transaction;

the amount of the transaction;

25 the goods or services being traded in the transaction;

the date of the transaction.

30 35. The method of claim 24 wherein said analysing step is carried out at said one or more workstations.

36. The method of claim 24 wherein said application is a web browser.

35

37. The method of claim 36 wherein said analysing step is performed by a plug-in module of said web browser.

38. The method of claim 37 wherein said web browser is Microsoft's Internet Explorer and said plug-in module is a Browser Helper Object.

5 39. The method of claim 24 wherein said application is an e-mail client.

10 40. The method of claim 39 wherein said analysing step is performed by a plug-in module of said e-mail client.

15 41. The method of claim 40 wherein said e-mail client is Microsoft's Outlook e-mail client and said plug-in module is a Microsoft Exchange client extension.

20 42. The method of claim 24 wherein said network includes a server and said analysing step is performed at a point on said network intermediate said one or more workstations and said server, or said analysing step is performed at said server.

25 43. The method of claim 24 further comprising the step of providing a supervisor workstation, said supervisor workstation having access to said data repository and being operable to view said relevant data stored in said data repository.

30 44. The method of claim 43 wherein said policy data is accessible by said supervisor workstation, such that a user of said supervisor workstation can edit said policy data.

35 45. The method of claim 24 wherein a workstation of said plurality of workstations has access to said

data repository and is operable to view said relevant data stored in said data repository.

46. The method of claim 24 wherein said computer
5 network to which said one or more workstations are adapted for connection is a public computer network, and wherein said one or more workstations together form a private computer network.

10 47. A computer program product, for controlling a plurality of computers in a private network to manage information, the network having a data repository arranged to receive data from the plurality of computers and policy data containing rules defining
15 relevant data which is to be extracted from at least one of outbound data transmitted to a public network or inbound data received from the public network and stored in the data repository, comprising:

20 a recording medium readable by the computer, having program code recorded thereon which when executed on each of said plurality of computers, configures said computers to:

analyse, in conjunction with an application
25 running on each of said computers that is operable to transmit the outbound data and receive the inbound data, at least one of said outbound data and said inbound data, with reference to said policy data, to identify in at least one of said outbound data and said inbound data, relevant data that is to be stored in
30 said data repository in accordance with said rules in said policy data; and

cause said relevant data to be stored in said data repository.

35 48. The computer program product of claim 47 wherein said program code when executed on said computer is operable to cause said relevant data that

is to be stored in said data repository to be encrypted prior to it being stored in said data repository.

49. The computer program product of claim 47
5 wherein said program code when executed on said computer is operable to cause said relevant data that is stored in said data repository to be encrypted.

50. The computer program product of claim 47
10 wherein said application is adapted to transmit outbound data to the Internet and receive inbound data from the Internet.

51. The computer program product of claim 50
15 wherein at least one of usernames and passwords used to identify a user, and usernames and passwords used to access web pages on the Internet, and the URL address of those web pages, are identified as relevant data.

52. The computer program product of claim 51
20 wherein usernames and passwords are identified from the field names of data contained in at least one of said outbound data and said inbound data.

53. The computer program product of claim 51
25 wherein a representation of the input fields of a web page is stored in said memory of said one or more workstations, and wherein said usernames and passwords are identified from said representation.

54. The computer program product of claim 51
30 wherein usernames or passwords are identified from the field types of data contained in said outbound or said inbound data.

55. The computer program product of claim 50
35 wherein digital certificates contained in at least one of said outbound or said inbound data or used to

digitally sign signed data in said inbound data or said outbound data, or sufficient descriptive data to identify any such digital certificates, are identified as relevant data.

5

56. The computer program product of claim 55 wherein one or more of the following data are identified as relevant data:

whether or not said digital certificate has
10 been revoked;

the identity of the holder of said digital certificate;

the amount of any eCommerce transaction being made that is related to said digital certificate;

15 the goods or services being sold in any eCommerce transaction being made with said digital certificate; and

the date of receipt of said digital certificate.

20

57. The computer program product of claim 50 wherein the program code when executed on said computer is further operable to:

identify when an eCommerce transaction is
25 occurring; and

if an eCommerce transaction is identified as occurring, to identify in said outbound or said inbound data one or more of the following data as relevant data:

30 the URL address or e-mail address of the remote location to which outbound data is being transmitted or inbound data is being received;

the web pages accessed by a user of said one or more workstations during the transaction;

35 the amount of the transaction;

the goods or services being traded in the transaction; and

the date of the transaction.

58. The computer program product of claim 47 wherein said program code is executable at each of said computers.

5

59. The computer program product of claim 47 wherein said application is a web browser.

60. The computer program product of claim 59 wherein said program code when executed on said computer is a plug-in module of said web browser.

61. The computer program product of claim 60 wherein said web browser is Microsoft's Internet Explorer and said plug-in module is a Browser Helper Object.

62. The computer program product of claim 47 wherein said application is an e-mail client.

20

63. The computer program product of claim 62 wherein said program code when executed on said computer is a plug-in module of said e-mail client.

64. The computer program product of claim 63 wherein said e-mail client is Microsoft's Outlook e-mail client and said plug-in module is a Microsoft Exchange client extension.

65. The computer program product of claim 47 wherein said network includes a server and said program code is executable at a point on said network intermediate said one or more workstations and said server, or said program code is executable at said server.

35

66. The computer program product of claim 47 further comprising program code recorded on the

recording medium which when executed on a computer in
said plurality of computers enables that computer as a
supervisor workstation, said supervisor workstation
having access to said data repository and being
5 operable to view said relevant data stored in said data
repository.

67. The computer program product of claim 66
wherein said policy data is accessible by said
10 supervisor workstation, such that a user of said
supervisor workstation can edit said policy data.

68. The computer program product of claim 47
further comprising program code recorded on the
15 recording medium which when executed on a computer in
said plurality of computers provides that computer with
access to said data repository such that a users of
said computer can view said relevant data stored in
said data repository.

20 69. A system for recording passwords and
usernames comprising:
a plurality of workstations adapted for
connection to the Internet, each workstation having a
25 memory;
a data repository arranged to receive data
from each of said workstations;
an application stored in said memory of each
workstation for transmitting outbound data and
30 receiving inbound data from the Internet; and/or an
application for receiving user input data; and
an analyser, said analyser being operable to
monitor at least one of said input data, said outbound
data and said inbound data, to identify usernames and
35 passwords contained in said user input data, said
outbound data or said inbound data, and to cause said
usernames and passwords to be stored in said data
repository.

70. The system of claim 69 wherein said analyser
is operable to determine whether the usernames and
passwords are used to access a web page, and if they
5 are, to identify the URL address of said web page and
cause said URL to be stored in said data repository
with said usernames and passwords.

71. The system of claim 69 wherein said relevant
10 usernames and passwords data are encrypted prior to
being transmitted to said data repository.

72. The system of claim 69 wherein said relevant
usernames and passwords that are stored in said data
15 repository are encrypted.

73. The system of claim 69 wherein said analyser
is operable to identify said relevant usernames and
passwords from the field names of data contained in at
20 least one of said outbound data or said inbound data.

74. The system of claim 69 wherein a
representation of the input fields of a web page is
stored in said memory of said one or more workstations,
25 and wherein said analyser is operable to identify said
relevant usernames and passwords from said
representation.

75. The system of claim 69 wherein said analyser
30 is operable to identify said relevant usernames or
passwords from the field types of data contained in
said outbound or said inbound data.

76. The system of claim 69 wherein said
35 application has a user interface provided with a
'remember password' option which when selected stores
input usernames and passwords in memory, and said
analyser is operable to identify said relevant

usernames and passwords in said input usernames and passwords stored in memory.

77. The system of claim 69 wherein said analyser
5 is located on each of said one or more workstations.

78. The system of claim 69 wherein said application is a web browser.

10 79. The system of claim 78 wherein said analyser is a plug-in module of said web browser.

80. The system of claim 79 wherein said web browser is Microsoft's Internet Explorer and said
15 analyser is a Browser Helper Object.

81. The system of claim 69 wherein said network comprises a server and said analyser is located at a point on said network intermediate said one or more
20 workstations and said server, or said analyser is located at said server.

82. The system of claim 69 further comprising a supervisor workstation, said supervisor workstation
25 having access to said data repository and being operable to view said relevant usernames and passwords stored in said data repository.

83. The system of claim 69 wherein a workstation
30 of said plurality of workstations has access to said data repository and is operable to view said relevant usernames and passwords stored in said data repository.

84. A method for recording passwords and
35 usernames comprising the steps of:
providing a plurality of workstations adapted for connection to the Internet, each workstation having a memory;

providing a data repository arranged to receive data from each of said workstations;

providing an application stored in said memory of each workstation for transmitting outbound
5 data and receiving inbound data from the Internet;
and/or an application for receiving user input data;
and

analysing at least one of said user input data, said outbound data and said inbound data, to
10 identify usernames and passwords; and

causing said usernames and passwords to be stored in said data repository.

85. The method of claim 84 further comprising the
15 steps of determining whether the usernames and passwords are used to access a web page, and if they are, identifying the URL address of said web page, and storing said URL in said data repository with said usernames and passwords.

20 86. The method of claim 84 further comprising the step of encrypting usernames and passwords prior to being stored in said data repository.

25 87. The method of claim 84 further comprising the step of encrypting the usernames and passwords that are stored in said data repository.

88. The method of claim 84 wherein in said
30 analysing step usernames and passwords are identified from the field names of data contained in at least one of said outbound data or said inbound data.

89. The method of claim 84 wherein a
35 representation of the input fields of a web page is stored in said memory of said workstation, and wherein in said analyser step usernames and passwords are identified from said representation.

90. The method of claim 84 wherein in said analysing step usernames and passwords are identified from the field types of data contained in said outbound
5 or said inbound data.

91. The method of claim 84 wherein said application has a user interface provided with a 'remember password' option which when selected stores
10 input usernames and passwords in said memory of said one or more workstations, and wherein in said analysing step usernames and passwords are identified from said input usernames and passwords stored in said memory of
said one or more workstations.

15 92. The method of claim 84 wherein said analysing step is performed on said one or more workstations.

93. The method of claim 84 wherein said
20 application is a web browser.

94. The method of claim 93 wherein said analysing step is performed by a plug-in module of said web
browser.

25 95. The method of claim 94 wherein said web browser is Microsoft's Internet Explorer and said plug-in module is a Browser Helper Object.

30 96. The method of claim 84 wherein said network comprises a server and said analysing step is performed at a point on said network intermediate said one or more workstations and said server, or said analysing step is performed at said server.

35 97. The method of claim 84 further comprising the step of providing a supervisor workstation, said supervisor workstation having access to said data

repository and being operable to view said relevant usernames and passwords stored in said data repository.

98. The method of claim 84 wherein a computer of
5 said plurality of computers has access to said data repository and is operable to view said relevant usernames and passwords stored in said data repository.

99. A computer program product, for controlling a
10 plurality of computers in a private network to record passwords and usernames, the network having a data repository arranged to receive data from the plurality of computers, said computer program product comprising:

a recording medium readable by the computer,
15 having program code recorded thereon which when executed on each of said plurality of computers, configures said computers to:

analyse, in conjunction with an application
running on the computer that is operable to transmit
20 outbound data to the Internet and receive inbound data from the Internet, and/or an application running on the computer for receiving user input data, at least one of said user input data, said outbound data and said inbound data, to identify in at least one of said user
25 input data, said outbound data and said inbound data, relevant data that is to be stored in said data repository; and

control said computer to store said relevant
data in said data repository.

30

100. The computer program product of claim 99 wherein said program code when executed on said computer is further operable to determine whether the usernames and passwords are used to access a web page,
35 and if they are, to identify the URL address of said web page and to direct the computer to store said URL in said data repository with said usernames and passwords.

101. The computer program product of claim 99 wherein said program code when executed on said computer is further operable to cause said usernames
5 and passwords to be encrypted prior to them being stored in said data repository.

102. The computer program product of claim 99 wherein said program code when executed on said
10 computer is further operable to cause said usernames and passwords that are stored in said data repository to be encrypted.

103. The computer program product of claim 99
15 wherein said program code when executed on said computer is operable to identify usernames and passwords from the field names of data contained in at least one of said outbound data or said inbound data.

20 104. The computer program product of claim 99 wherein a representation of the input fields of a web page is stored in the memory of said computer, and wherein said program code when executed on said computer is operable to identify usernames and
25 passwords from said representation.

105. The computer program product of claim 99 wherein said program code when executed on said computer is further operable to identify usernames and
30 passwords from the field types of data contained in said outbound or said inbound data.

106. The computer program product of claim 99 wherein said application for receiving user input data
35 has a user interface provided with a 'remember password' option which when selected stores input usernames and passwords in said memory of said computer, and wherein said program code when executed

on said computer is operable to identify usernames and passwords from said input usernames and passwords stored in said memory of said computer.

5 107. The computer program product of claim 99 wherein said program code is executable at each of said computers.

10 108. The computer program product of claim 99 wherein said application is a web browser.

15 109. The computer program product of claim 108 wherein said program code when executed on said computer is a plug-in module of said web browser.

20 110. The computer program product of claim 109 wherein said web browser is Microsoft's Internet Explorer and said plug-in module is a Browser Helper Object.

25 111. The computer program product of claim 99 wherein said network comprises a server and said program code is executable at a point on said network intermediate said computer and said server, or said program code is executable at said server.

30 112. The computer program product of claim 99 further comprising program code which when executed on said computer enables that computer as a supervisor workstation, said supervisor workstation having access to said data repository and being operable to view said relevant usernames and passwords stored in said data repository.

35 113. The computer program product of claim 99 wherein a computer of said plurality of computers has access to said data repository and is operable to view

said relevant usernames and passwords stored in said data repository.

114. An information management system comprising:
- 5 one or more workstations adapted for connection to a computer network, each workstation having a memory;
- an application stored in said memory of each workstation for transmitting outbound data to said
- 10 network and receiving inbound data from said network;
- policy data containing rules specifying an appropriate encryption strength for outbound data, the encryption strength depending on the content of the data; and
- 15 an analyser, said analyser being operable in conjunction with said policy data to monitor said outbound data and to determine, in accordance with said rules in said policy data, an appropriate encryption strength for the outbound data;
- 20 wherein said analyser controls transmission of said outbound data from said application in dependence upon said determination of an appropriate encryption strength.
- 25 115. The system of claim 114 wherein said rules in said policy data define confidential data which can not be transmitted, said analyser being operable in conjunction with said policy data to prevent said confidential data being transmitted from said
- 30 application.

116. The system of claim 114 wherein said analyser is further operable to determine the present encryption strength in use for transmitting said
- 35 outbound data; and
- wherein said analyser controls transmission of said outbound data from said application both in dependence upon said determination of an appropriate

encryption strength and in dependence upon said determination of the present encryption strength in use.

5 117. The system of claim 116 wherein if the analyser determines that the present encryption strength in use for transmitting outbound data is less than said appropriate encryption strength, then said analyser prevents transmission of said outbound data
10 from said application.

118. The system of claim 116 wherein if the analyser determines that the present encryption strength in use for transmitting outbound data is less
15 than said appropriate encryption strength, then said analyser prevents transmission of said outbound data from said application and controls said application to renegotiate an encryption strength for transmission that is appropriate.

20 119. The system of claim 116 wherein if the analyser determines that the present encryption strength in use for transmitting outbound data is less than said appropriate encryption strength, then said
25 analyser modifies the outbound data such that the present encryption strength is an appropriate encryption strength for the transmission of the modified outbound data.

30 120. The system of claim 116 wherein if the analyser determines that the present encryption strength in use for transmitting outbound data is less than said appropriate encryption strength, then said analyser controls said application to notify a user of
35 said application that the encryption strength in use is not sufficient.

121. The system of claim 114 wherein the analyser is further operable to identify credit card numbers in said outbound data.

5 122. The system of claim 121 wherein the analyser is further operable to distinguish a predetermined set of credit card numbers from other credit card numbers, wherein said rules of said policy data define different appropriate encryption strengths for outbound data
10 containing credit card numbers in the predetermined set than for other credit card numbers.

123. The system of claim 122 wherein said rules of said policy data specify that there is no appropriate
15 encryption strength for a pre-determined set of one or more credit card numbers.

124. The system of claim 114 wherein said analyser is further operable to identify at least one or more
20 of, credit card numbers, account codes, usernames, passwords, names and addresses and other predetermined keywords in the content of said outbound data.

125. The system of claim 114 wherein said rules in
25 said policy data specify an appropriate encryption strength for said outbound data, that is dependent on the address to which said outbound data is to be transmitted.

30 126. The system of claim 114 wherein said analyser is located on each of said one or more workstations.

127. The system of claim 114 wherein said
application is a web browser.

35

128. The system of claim 127 wherein said analyser is a plug-in module of said web browser.

129. The system of claim 128 wherein said web browser is Microsoft's Internet Explorer and said analyser is a Browser Helper Object.

5 130. The system of claim 114 wherein said application is an e-mail client.

10 131. The system of claim 130 wherein said analyser is a plug-in module of said e-mail client.

132. The system of claim 131 wherein said e-mail client is Microsoft's Outlook e-mail client and said analyser is a Microsoft client extension.

15 133. The system of claim 114 wherein said network comprises a server and said analyser is located at a point on said network intermediate said one or more workstations and said server, or said analyser is located at said server.

20 134. The system of claim 114 wherein said computer network to which said one or more workstations are adapted for connection is a public computer network, and wherein said one or more workstations together form
25 a private computer network.

135. The system of claim 114 further comprising a supervisor workstation, said policy data being accessible by said supervisor workstation, such that a
30 user of said supervisor workstation can edit said policy data.

136. A method of managing information comprising the steps of:
35 providing one or more workstations adapted for connection to a computer network, each workstation having a memory;

5 providing policy data containing rules
specifying an appropriate encryption strength for
outbound data, the encryption strength depending on the
content of the data; and

137. The method of claim 136 wherein said rules in
said policy data define confidential data which cannot
be transmitted, and wherein in said controlling step
transmission of said confidential data is prevented.

wherein in said controlling step the transmission of said outbound data from said application is dependent upon both the determination of an appropriate encryption strength and the determination of the present encryption strength in use.

139. The method of claim 138 wherein if it is determined that the present encryption strength in use
35 for transmitting outbound data is less than said appropriate encryption strength, then in said controlling step transmission of said outbound data from said application is prevented.

140. The method of claim 138 wherein if in said analysing step it is determined that the present encryption strength in use for transmitting outbound
5 data is less than said appropriate encryption strength, then in said controlling step an encryption strength appropriate for transmission of said outbound data is negotiated before transmission.

10 141. The method of claim 138 wherein if in said analysing step it is determined that the present encryption strength in use for transmitting outbound data is less than said appropriate encryption strength, then in said controlling step the outbound data is
15 modified such that the present encryption strength is an appropriate encryption strength.

142. The method of claim 138 wherein in said analysing step if it is determined that the present
20 encryption strength in use for transmitting outbound data is less than said appropriate encryption strength, then in said controlling step a user of said application is notified that the encryption strength in use is not sufficient.

25 143. The method of claim 136 wherein said analysing step includes identifying credit card numbers in said outbound data.

30 144. The method of claim 143 wherein said analysing step includes distinguishing a pre-determined set of one or more credit card numbers from other credit card numbers, and wherein said rules of said policy data define a different appropriate encryption
35 strength for outbound data containing credit card numbers in that pre-determined set than for other credit card numbers.

145. The method of claim 144 wherein said rules of said policy data specifies that there is no appropriate encryption strength for said pre-determined set of one or more credit card numbers.

5

146. The method of claim 136 wherein said analysing step includes identifying at least one or more of, credit card numbers, account codes, usernames, passwords, names and addresses and other predetermined keywords in the content of said outbound data.

10

147. The method of claim 136 wherein said rules in said policy data specify an appropriate encryption strength for said outbound data, that is dependent on the address to which said outbound data is to be transmitted.

15

148. The method of claim 136 wherein said analysing step is performed at said one or more workstations.

20

149. The method of claim 136 wherein said application is a web browser.

25

150. The method of claim 149 wherein said analysing step is performed by a plug-in module of said web browser.

30

151. The method of claim 150 wherein said web browser is Microsoft's Internet Explorer and said plug-in module is a Browser Helper Object.

35

152. The method of claim 136 wherein said application is an e-mail client.

153. The method of claim 152 wherein said analysing step is performed by a plug-in module of said e-mail client.

154. The method of claim 153 wherein said e-mail client is Microsoft's Outlook e-mail client and said plug-in module is a Microsoft Exchange client
5 extension.

155. The method of claim 136 wherein said network comprises a server and said analysing step is performed at a point on said network intermediate said one or
10 more workstations and said server, or said analysing step is performed at said server.

156. The method of claim 136 wherein said computer network to which said one or more workstations are
15 adapted for connection is a public computer network, and wherein said one or more workstations together form a private computer network.

157. The method of claim 136 further comprising
20 the step of providing a supervisor workstation, said policy data being accessible by said supervisor workstation, such that a user of said supervisor workstation can edit said policy data.

25 158. A computer program product for controlling a computer connected to a public network to manage information, the computer having access to policy data containing rules specifying an appropriate encryption strength for outbound data transmitted to the public
30 network, the encryption strength depending on the content of the data, comprising:

a recording medium readable by the computer, having program code recorded thereon which when executed on said computer, configures said computer to:
35 determine, in conjunction with an application running on the computer that is operable at least to transmit outbound data to said public network, with reference to said rules in said policy data, an

appropriate encryption strength for the outbound data;
and

control the transmission of said outbound
data by said application in dependence upon the
5 determination of an appropriate encryption strength.

159. The computer program product of claim 158
wherein said rules in said policy data define
confidential data which cannot be transmitted, wherein
10 said program code when executed on said computer is
operable to prevent transmission of said confidential
data from said application.

160. The computer program product of claim 158
15 wherein said program code when executed on said
computer is further operable to determine the present
encryption strength in use for transmitting said
outbound data; and

to control the transmission of said outbound
20 data from said application in dependence upon both the
determination of an appropriate encryption strength and
the determination of the present encryption strength in
use.

25 161. The computer program product of claim 160
wherein said program code when executed on said
computer is further operable, if it is determined that
the present encryption strength in use for transmitting
outbound data is less than said appropriate encryption
30 strength, to prevent the transmission of said outbound
data from said application.

162. The computer program product of claim 160
wherein said program code when executed on said
35 computer is further operable, if it is determined that
the present encryption strength in use for transmitting
outbound data is less than said appropriate encryption
strength, to negotiate an appropriate encryption

strength for transmission of said outbound data before transmission.

163. The computer program product of claim 160
5 wherein said program code when executed on said
computer is further operable, if it is determined that
the present encryption strength in use for transmitting
outbound data is less than said appropriate encryption
strength, to modify the outbound data such that the
10 present encryption strength is an appropriate
encryption strength.

164. The computer program product of claim 160
wherein said program code when executed on said
15 computer is further operable, if it is determined that
the present encryption strength in use for transmitting
outbound data is less than said appropriate encryption
strength, to provide notification that the encryption
strength in use is not sufficient.

165. The computer program product of claim 158
wherein said program code when executed on said
computer is further operable to identify credit card
numbers in said outbound data.

166. The computer program product of claim 165
wherein said program code when executed on said
computer is further operable to identify a pre-
determined set of one or more credit card numbers from
30 other credit card numbers, and wherein said rules of
said policy data define a different appropriate
encryption strength for outbound data containing credit
card numbers in that pre-determined set than for other
credit card numbers.

167. The computer program product of claim 166
wherein said rules of said policy data specifies that

there is no appropriate encryption strength for said pre-determined set of one or more credit card numbers.

168. The computer program product of claim 158
5 wherein said program code when executed on said computer is further operable, to identify at least one or more of, credit card numbers, account codes, usernames, passwords, names and addresses and other predetermined keywords in the content of said outbound
10 data.

169. The computer program product of claim 158 wherein said rules in said policy data specify an appropriate encryption strength for said outbound data,
15 that is dependent on the address to which said outbound data is to be transmitted.

170. The computer program product of claim 158 wherein said program code is executable on said
20 computer.

171. The computer program product of claim 158 wherein said application is a web browser.

25 172. The computer program product of claim 171 wherein said program code when executed on said computer is a plug-in module of said web browser.

173. The computer program product of claim 172
30 wherein said web browser is Microsoft's Internet Explorer and said plug-in module is a Browser Helper Object.

174. The computer program product of claim 158
35 wherein said application is an e-mail client.

175. The computer program product of claim 174 wherein said program code when executed on said computer is a plug-in module of said e-mail client.

5 176. The computer program product of claim 175 wherein said e-mail client is Microsoft's Outlook e-mail client and said plug-in module is a Microsoft Exchange client extension.

10 177. The computer program product of claim 158 wherein said network includes a server and said program code is executable at a point on said network intermediate said one or more workstations and said server, or program code is executable at said server.

15

178. An information management system comprising:
a plurality of client workstations adapted
20 for connection to a computer network, each workstation having a memory;

a data repository arranged to receive data from each of said client workstations;

an application stored in said memory of each
25 workstation for transmitting outbound data to said network and receiving inbound data from said network;

policy data defining rules for the recording of data that may comprise part of a transaction conducted between a client workstation and a third
30 party across said computer network;

an analyser, said analyser being operable in conjunction with said policy data to analyse at least one of said outbound data and said inbound data, to identify the existence of a transaction occurring
35 between a client workstation and a third party by analysing said outbound or said inbound data, and to cause transaction data that is all or part of said outbound data or said inbound data related to an

identified transaction to be stored in said data repository.

179. The system of claim 178 wherein said analyser
5 is operable to determine whether a secure link has been negotiated between said application and a remote site on said network, and to identify the existence of a transaction if said outbound data or said inbound data is transmitted on a secure link.

10

180. The system of claim 179 wherein said network is the Internet, and said rules of said policy data define the addresses of non-eCommerce web sites and/or non-eCommerce e-mail accounts, said analyser being
15 operable to disregard any transactions that are identified between a client workstation and a non-eCommerce web site and/or e-mail account such that no transaction data related to a transaction made to a non-eCommerce web sites or a non-eCommerce e-mail
20 account is stored in the data repository.

181. The system of claim 178 wherein said analyser is operable to identify the existence of a transaction by reference to said rules of said policy data, said
25 rules of said policy data defining the addresses of known eCommerce locations.

182. The system of claim 178 wherein said analyser is operable to identify credit card numbers, and to
30 identify the existence of a transaction by identifying credit card numbers in said outbound data or inbound data.

183. The system of claim 178 wherein said analyser
35 is operable to identify the existence of a transaction by reference to said rules of said policy data, said rules of said policy data defining one or more of pre-determined digital certificates, account codes, pre-

determined keywords, pre-determined names and addresses and embedded codes.

184. The system of claim 178 wherein said analyser
5 is operable to identify embedded codes in said inbound data, said embedded code having been placed in said inbound data to identify it as transaction data.

185. The system of claim 178 wherein said analyser
10 is operable to identify electronic receipts, and to identify the existence of a transaction by identifying an electronic receipt in said outbound or inbound data.

186. The system of claim 178 wherein said analyser
15 is operable to record a pre-determined number of subsequent transmissions of said outbound data or said inbound data following an identification of the existence of a transaction by said analyser, providing that the address or organisation to which the
20 subsequent transmissions are sent, or from which they are received, is the same as the address or organisation to which the outbound data was sent or from which the inbound data was received and in which the existence of a transaction was identified.

25
187. The system of claim 186, wherein said analyser is operable to detect one or more indicators of the nature of the transaction, and said rules of said policy data define the number of subsequent
30 transmissions of said outbound data and said inbound data that are to be recorded in said data repository based on the identified nature of the transaction.

188. The system of claim 186 wherein said rules of
35 said policy data define the number of subsequent transmissions of said outbound and said inbound data that are to be stored in said data repository in

dependence on the indicator by which the existence of a transaction was identified.

189. The system of claim 178 wherein said analyser
5 is operable to record all subsequent transmissions of
said outbound data or said inbound data that occur
within a pre-determined amount of time following an
identification of the existence of a transaction by
said analyser, providing that the address or
10 organisation to which the subsequent transmissions are
sent, or from which they are received, is the same as
the address or organisation to which the outbound data
was sent or from which the inbound data was received
and in which the existence of a transaction was
15 identified.

190. The system of claim 189, wherein said
analyser is operable to detect one or more indicators
of the nature of the transaction, and said rules of
20 said policy data define the amount of time for which
all subsequent transmissions of said outbound data and
said inbound data are to be recorded in said data
repository based on the identified nature of the
transaction.

25
191. The system of claim 189 wherein said rules of
said policy data define the amount of time for which
subsequent transmissions of said outbound and said
inbound data are to be stored in said data repository
30 in dependence on the indicator by which the existence
of a transaction was identified.

192. The system of claim 178 wherein said analyser
is further operable to identify the completion of a
35 transaction by analysing said outbound data or said
inbound data, and to cause all or part of said outbound
data transmitted by said application and all or part of
said inbound data received by said application after

said analyser has identified the existence of a transaction and before said analyser has identified the completion of a transaction to be stored in said data repository.

5

193. The system of claim 192 wherein said analyser is operable to identify subsequent related data in said outbound data transmitted by said application and said inbound data received by said application after said
10 analyser has identified the completion of a transaction, and to cause said subsequent related data to be stored in said data repository with said transaction data already identified.

194. The system of claim 193 wherein said analyser is operable to identify said subsequent related data by identifying common indicators in both said transaction data already identified and said outbound data transmitted by said application and said inbound data
20 received by said application after said analyser has identified the completion of a transaction, said common indicators being one or more of the address of the location to which said outbound data is transmitted or from which said inbound data is received, part of the
25 data path to the location to which said outbound data is transmitted or from which said inbound data is received, account code or reference numbers.

195. The system of claim 178 wherein said
30 application is operable such that a user of said application can indicate said outbound and said inbound data that is related to a transaction, said analyser being operable to identify said outbound and said inbound data so indicated.

35

196. The system of claim 178 wherein said application is operable to store all of said outbound data and said inbound data in said memory of said

workstation as previous data, irrespective of whether it may or may not be part of a transaction and, said analyser is operable, if the existence of a transaction is identified, to retrieve a pre-determined amount of
5 previous data from said outbound data and said inbound data stored in said memory of said workstation, and to cause said previous data to be stored in said data repository with said transaction data.

10 197. The system of claim 196 wherein said rules of said policy data specify the amount of previous data that is to be retrieved in dependence on the indicator by which the existence of a transaction is identified.

15 198. The system of claim 196 wherein said network is the Internet and said application is a web browser, said web browser being operable to store each web page that is viewed by said web browser in memory as
20 previous data.

199. The system of claim 198 wherein said rules of said policy data specify the number of web pages that are to be retrieved from those previously stored in
25 memory in dependence on the indicator by which the existence of a transaction is identified.

200. The system of claim 178 wherein said application is operable to store all of said outbound
30 data and said inbound data in memory as previous data, irrespective of whether it may or may not be part of a transaction and, said analyser is operable, if the existence of a transaction is identified, to identify, in said previous data, earlier relevant data that is
35 related to said transaction data already identified, and to cause said earlier relevant data to be stored in said data repository with said transaction data.

201. The system of claim 200 wherein said analyser is operable to identify said earlier relevant data in said previous data, by identifying common indicators in both said transaction data and said outbound data and
5 said inbound data previously stored in said memory of said workstation, said common indicators being one or more of the address of the location to which said outbound data is transmitted or from which said inbound data is received, part of the data path to the location
10 to which said outbound data is transmitted or said inbound data is received, account code or reference number.

202. The system of claim 178 wherein said
15 application is operable to store all of said outbound data and said inbound data in memory as previous data, irrespective of whether it may or may not be part of a transaction, and is further operable such that, if said analyser identifies the existence of a transaction, a
20 user of said application can select earlier relevant data from said previous data, said earlier relevant data selected by the user being stored in said common data repository together with said transaction data.

203. The system of claim 178 wherein said analyser
25 is operable, once it has identified the existence of a transaction, to determine the nature of said transaction by analysing the content of said outbound and inbound data, and said rules of said policy data
30 define how said transaction data is to be stored in said data repository in dependence on the nature of the transaction determined by said analyser, said transaction data being stored in said database according to said determination and said rules of said
35 policy data.

204. The system of claim 203 wherein said analyser is operable to determine the nature of the transaction

by identifying in said outbound data and said inbound data one or more indicators, said indicators being defined in said rules of said policy data, and being one or more of: the address of the network location to which said data that may be part of a transaction is transmitted or from which it is received; part of the data path to the network location to which said transaction data is transmitted or from which it is received; account codes; reference numbers; credit card numbers; digital certificates and pre-determined keywords.

205. The system of claim 178 wherein said analyser is operable to identify, once the existence of a transaction has been identified, one or more indicators of the nature of said transaction, said transaction data being stored in said data repository such that it is organised by said one or more indicators to form a record.

206. The system of claim 205 wherein said rules of said policy data define said one or more indicators of the nature of a transaction, said indicators being one or more of: the address of the location to which said transaction data is transmitted or from which it is received; part of the data path to the location to which said transaction data is transmitted or from which it is received; account codes, reference numbers, credit card numbers, digital certificates and pre-determined keywords.

207. The system of claim 178 wherein said data repository is accessible by one or more of an accounts application, an order processing application or other transaction management application.

208. The system of claim 178 wherein any data transmitted to said data repository is encrypted before it is transmitted to said data repository.

5 209. The system of claim 178 wherein any data stored in said data repository is encrypted.

210. The system of claim 178 wherein said analyser is located on each of said one or more workstations.
10

211. The system of claim 178 wherein said application is a web browser.

212. The system of claim 211 wherein said analyser is a plug-in module of said web browser.
15

213. The system of claim 212 wherein said web browser is Microsoft's Internet Explorer and said analyser is a Browser Helper Object.
20

214. The system of claim 178 wherein said application is an e-mail client.

215. The system of claim 214 wherein said analyser is a plug-in module of said e-mail client.
25

216. The system of claim 215 wherein said e-mail client is Microsoft's Outlook e-mail client and said analyser is a Microsoft Exchange client extension.
30

217. The system of claim 178 wherein said network comprises a server, and said analyser is located at a point on said network intermediate said one or more work stations and said server, or said analyser is located at said server.
35

218. The system of claim 178 wherein said computer network to which said one or more workstations are

adapted for connection is a public computer network,
and wherein said one or more workstations together form
a private computer network.

5 219. The system of claim 178 further comprising a
supervisor workstation, said policy data being
accessible by said supervisor workstation, such that a
user of said supervisor workstation can edit said
policy data.

10

220. A method of managing information comprising
the steps of:

 providing a plurality of client workstations
adapted for connection to a computer network, each
15 workstation having a memory;

 providing a data repository arranged to
receive data from each of said client workstations;

 providing an application stored in said
memory of each workstation for transmitting outbound
20 data to said network and receiving inbound data from
said network;

 providing policy data defining rules for the
recording of data that may comprise part of a
transaction conducted between a client workstation and
25 a third party across said computer network; and

 analysing, at least one of said outbound data
and said inbound data to identify, with reference to
said rules of said policy data, the existence of a
transaction occurring between a client workstation and
30 a third party; and

 storing transaction data that is all or part
of said outbound data or said inbound data related to
an identified transaction in said data repository.

35 221. The method of claim 220 wherein in said
analysing step the existence of a transaction is
identified by determining whether a secure link has
been negotiated between said application and a remote

site on said network, and by determining whether said outbound data or said inbound data is transmitted on that link.

5 222. The method of claim 221 wherein said network
is the Internet, and said rules of said policy data
define the addresses of non-eCommerce web sites and/or
non-eCommerce e-mail accounts, wherein said analysing
step includes disregarding any transactions that are
10 identified between a client workstation and a non-
eCommerce web site and/or e-mail account such that no
transaction data related to a transaction made to a
non-eCommerce web site or a non-eCommerce e-mail
account is stored in the data repository.

15 223. The method of claim 220 wherein said
analysing step includes identifying the existence of a
transaction by reference to said rules of said policy
data, said rules of said policy data defining the
20 addresses of known eCommerce locations.

224. The method of claim 220 wherein said
analysing step includes identifying credit card
numbers, and the existence of a transaction is
25 identified by identifying credit card numbers in said
outbound data or inbound data.

225. The method of claim 220 wherein in said
analysing step the existence of a transaction is
30 identified by reference to said rules of said policy
data, said rules of said policy data defining one or
more of pre-determined digital certificates, account
codes, pre-determined keywords, pre-determined names
and addresses and embedded codes.

35 226. The method of claim 220 wherein said
analysing step includes detecting an embedded code in
said inbound data, said embedded code having been

placed in said inbound data to identify it as transaction data.

227. The method of claim 220 wherein in said
5 analysing step, the existence of a transaction is identified by identifying an electronic receipt in said outbound or inbound data.

228. The method of claim 220 further comprising
10 the step of recording a pre-determined number of subsequent transmissions of said outbound data or said inbound data following an identification of the existence of a transaction in said analysing step, providing that the address or organisation to which the
15 subsequent transmissions are sent, or from which they are received, is the same as the address or organisation to which the outbound data was sent or from which the inbound data was received and in which the existence of a transaction was identified.

20
229. The method of claim 228, wherein said analysing step includes detecting one or more indicators of the nature of the transaction, and said rules of said policy data define the number of
25 subsequent transmissions of said outbound data and said inbound data that are to be recorded in said data repository based on the identified nature of the transaction.

30 230. The method of claim 228 wherein said rules of said policy data define the number of subsequent transmissions of said outbound and said inbound data that are to be stored in said data repository in dependence on the indicator by which the existence of a
35 transaction was identified.

231. The method of claim 220 further comprising the step of recording all subsequent transmissions of

said outbound data or said inbound data that occur within a pre-determined amount of time following an identification of the existence of a transaction in said analysing step, providing that the address or
5 organisation to which the subsequent transmissions are sent, or from which they are received, is the same as the address or organisation to which the outbound data was sent or from which the inbound data was received and in which the existence of a transaction was
10 identified.

232. The method of claim 231, wherein said analysing step includes detecting one or more indicators of the nature of the transaction, and said
15 rules of said policy data define the amount of time for which all subsequent transmissions of said outbound data and said inbound data are to be recorded in said data repository based on the identified nature of the transaction.

20
233. The method of claim 231 wherein said rules of said policy data define the amount of time for which subsequent transmissions of said outbound and said inbound data are to be stored in said data repository
25 in dependence on the indicator by which the existence of a transaction was identified.

234. The method of claim 220 wherein said analysing step includes identifying the completion of a
30 transaction by analysing said outbound data or said inbound data, and said storing step includes storing all or part of said outbound data transmitted by said application and all or part of said inbound data received by said application, after the existence of a
35 transaction has been identified and before the completion of a transaction has been identified, in said data repository.

235. The method of claim 234 wherein said analysing step includes identifying subsequent related data contained in said outbound data transmitted by said application and said inbound data received by said application after the completion of a transaction, and said storing step includes storing said subsequent related data in said data repository with said transaction data already identified.

236. The method of claim 235 wherein said analysing step includes identifying said subsequent related data by identifying common indicators in both said transaction data already identified and said outbound data transmitted by said application and said inbound data received by said application after the completion of a transaction has been identified,

said common indicators being one or more of the address of the location to which said outbound data is transmitted or from which said inbound data is received, part of the data path to the location to which said outbound data is transmitted or from which said inbound data is received, account code or reference numbers.

237. The method of claim 220 wherein said application is operable such that a user of said application can indicate said outbound and said inbound data that is related to a transaction, said analysing step including identifying indicated outbound and inbound data.

238. The method of claim 220 further comprising the step of storing all of said outbound data and said inbound data in said memory of said workstation as previous data, irrespective of whether it may or may not be part of a transaction and, said analysing step includes retrieving a pre-determined amount of previous data from said outbound data and said inbound data

stored in said memory of said workstation if the existence of a transaction is identified, and said storing step includes storing said previous data in said data repository with said transaction data.

5

239. The method of claim 238 wherein said rules of said policy data specify the amount of previous data that is to be retrieved in dependence on the indicator by which the existence of a transaction is identified.

10

240. The method of claim 238 wherein said network is the Internet and said application is a web browser, said web browser being operable to store each web page that is viewed by said web browser in memory as previous data.

15

241. The method of claim 240 wherein said rules of said policy data specify the number of web pages that are to be retrieved from those previously stored in memory in dependence on the indicator by which the existence of a transaction is identified.

20

242. The method of claim 220 further comprising the step of storing all of said outbound data and said inbound data in memory as previous data, irrespective of whether it may or may not be part of a transaction and, said analysing step includes identifying, in said previous data, earlier relevant data that is related to said transaction data already identified, and said storing step includes storing said earlier relevant data in said data repository with said transaction data.

30

243. The method of claim 242 wherein said analysing step includes identifying said earlier relevant data in said previous data, by identifying common indicators in both said transaction data and

35

said previous data, said common indicators being one or more of the address of the location to which said outbound data is transmitted or from which said inbound data is received, part of the data path to the location
5 to which said outbound data is transmitted or said inbound data is received, account code or reference number.

244. The method of claim 220 further comprising
10 the steps of storing all of said outbound data and said inbound data in memory as previous data, irrespective of whether it may or may not be part of a transaction; and

if the existence of a transaction is
15 identified, providing a user of said application with a selector for selecting earlier relevant data from said previous data, and wherein said storing step includes storing said earlier relevant data selected by the user in said data repository together with said transaction
20 data.

245. The method of claim 220 wherein said analysing step includes, once the existence of a transaction has been identified, determining the nature
25 of said transaction by analysing the content of said outbound and inbound data, said rules of said policy data defining how said transaction data is to be stored in said data repository in dependence on the nature of the transaction determined in said analysing step, said
30 transaction data being stored in said database according to said determination and said rules of said policy data.

246. The method of 245 wherein said analysing step
35 includes determining the nature of the transaction by identifying in said outbound data and said inbound data one or more indicators, said indicators being defined in said rules of said policy data, and being one or

more of: the address of the network location to which
said data that may be part of a transaction is
transmitted or from which it is received; part of the
data path to the network location to which said
5 transaction data is transmitted or from which it is
received; account codes; reference numbers; credit card
numbers; digital certificates and pre-determined
keywords.

10 247. The method of claim 220 wherein said
analysing step includes identifying, once the existence
of a transaction has been identified, one or more
indicators of the nature of said transaction, and said
storing step includes organising transaction data
15 stored in said data repository by said one or more
indicators such that it forms a record.

248. The method of claim 247 wherein said rules of
said policy data define said one or more indicators of
20 the nature of a transaction, said indicators being one
or more of: the address of the location to which said
transaction data is transmitted or from which it is
received; part of the data path to the location to
which said transaction data is transmitted or from
25 which it is received; account codes, reference numbers,
credit card numbers, digital certificates and pre-
determined keywords.

249. The method of claim 220 wherein said data
30 repository is accessible by one or more of an accounts
application, an order processing application or other
transaction management application.

250. The method of claim 220 further comprising
35 the step of encrypting any relevant data identified in
said analysing step before it is stored in said data
repository.

251. The method of claim 220 further comprising the step of encrypting the data stored in said data repository.

5 252. The method of claim 220 wherein said analysing step is performed at said one or more workstations.

10 253. The method of claim 220 wherein said application is a web browser.

15 254. The method of claim 253 wherein said analysing step is performed by a plug-in module of said web browser.

255. The method of claim 254 wherein said web browser is Microsoft's Internet Explorer and said plug-in module is a Browser Helper Object.

20 256. The method of claim 220 wherein said application is an e-mail client.

25 257. The method of claim 256 wherein said analysing step is performed by a plug-in module of said e-mail client.

30 258. The method of claim 257 wherein said e-mail client is Microsoft's Outlook e-mail client and said plug-in module is a Microsoft Exchange client extension.

35 259. The method of claim 220 wherein said network comprises a server, and said analysing step is performed at a point on said network intermediate said one or more work stations and said server, or said analysing step is performed at said server.

260. The method of claim 220 wherein said computer network to which said one or more workstations are adapted for connection is a public computer network, and wherein said one or more workstations together form
5 a private computer network.

261. The method of claim 220 further comprising the step of providing a supervisor workstation, said policy data being accessible by said supervisor
10 workstation, such that a user of said supervisor workstation can edit said policy data.

262. A computer program product for controlling a plurality of computers in a private network to manage
15 information, the network having a data repository arranged to receive data from the plurality of computers, and policy data defining rules for the recording of data that may comprise part of a transaction conducted between a computer in the private
20 network and a third party across a public network, comprising:

a recording medium readable by a computer, having program code recorded thereon which when executed on each of said plurality of computers
25 configures said computers to:

analyse, in conjunction with an application running on the computer that is operable to transmit outbound data to said public network and receive inbound data from said public network, at least one of
30 said outbound data and said inbound data to identify, with reference to said rules of said policy data, the existence of a transaction occurring between the computer and a third party; and

to control said computer to store transaction
35 data that is all or part of said outbound data or said inbound data related to an identified transaction in said data repository.

263. The computer program product of claim 262 wherein said program code when executed on said computer is operable to identify the existence of a transaction by determining whether a secure link has
5 been negotiated between said application and a remote site on said public network, and whether the outbound data or said inbound data is transmitted on that link.

264. The computer program product of claim 263
10 wherein said public network is the Internet, and said rules of said policy data define the addresses of non-eCommerce web sites and/or non-eCommerce e-mail accounts, wherein said program code when executed on said computer is operable to disregard any transactions
15 that are identified between the computer and a non-eCommerce web site and/or e-mail account such that no transaction data related to a transaction made to a non-eCommerce web sites or a non-eCommerce e-mail account is stored in the data repository.

20
265. The computer program product of claim 262 wherein said program code when executed on said computer is operable to identify the existence of a transaction by reference to said rules of said policy
25 data, said rules of said policy data defining the addresses of known eCommerce locations.

266. The computer program product of claim 262 wherein said program code when executed on said
30 computer is operable to identify credit card numbers, and the existence of a transaction is identified by identifying credit card numbers in said outbound data or inbound data.

35 267. The computer program product of claim 262 wherein said program code when executed on said computer is operable to identify the existence of a transaction by reference to said rules of said policy

data, said rules of said policy data defining one or more of pre-determined digital certificates, account codes, pre-determined keywords, pre-determined names and addresses and embedded codes.

5

268. The computer program product of claim 262 wherein said program code when executed on said computer is operable to identify in said inbound data an embedded code, said embedded code having been placed
10 in said inbound data to identify it as transaction data.

269. The computer program product of claim 262 wherein said program code when executed on said
15 computer is operable to identify the existence of a transaction by identifying an electronic receipt in said outbound or inbound data.

270. The computer program product of claim 262
20 wherein said program code when executed on said computer is further operable to control the computer to record a pre-determined number of subsequent transmissions of said outbound data or said inbound data following an identification of the existence of a
25 transaction, providing that the address or organisation to which the subsequent transmissions are transmitted, or from which they are received, is the same as the address or organisation to which the outbound data was sent or from which the inbound data was received and in
30 which the existence of a transaction was identified.

271. The computer program product of claim 270, wherein said program code when executed on said computer is operable to detect one or more indicators
35 of the nature of the transaction, and said rules of said policy data define the number of subsequent transmissions of said outbound data and said inbound

data that are to be recorded in the data repository based on the identified nature of the transaction.

272. The computer program product of claim 270
5 wherein said rules of said policy data define the number of subsequent transmissions of said outbound and said inbound data that are to be stored in said data repository in dependence on the indicator by which the existence of a transaction was identified.

10

273. The computer program product of claim 262
wherein said program code when executed on said computer is operable to control the computer to record all subsequent transmissions of said outbound data or
15 said inbound data that occur within a pre-determined amount of time following an identification of the existence of a transaction, providing that the address or organisation to which the subsequent transmissions are transmitted, or from which they are received, is
20 the same as the address or organisation to which the outbound data was transmitted or from which the inbound data was received and in which the existence of a transaction was identified.

274. The computer program product of claim 273
25 wherein said program code when executed on said computer is operable to detect one or more indicators of the nature of the transaction, and said rules of said policy data define the amount of time for which
30 all subsequent transmissions of said outbound data and said inbound data are to be recorded in said data repository based on the identified nature of the transaction.

275. The computer program product of claim 273
35 wherein said rules of said policy data define the amount of time for which subsequent transmissions of said outbound and said inbound data are to be stored in

said data repository in dependence on the indicator by which the existence of a transaction was identified.

276. The computer program product of claim 262
5 wherein said program code when executed on said
computer is operable to identify the completion of a
transaction, and control the computer to store all or
part of said outbound data transmitted by said
application and all or part of said inbound data
10 received by said application after the existence of a
transaction has been identified and before the
completion of a transaction has been identified in
said data repository.

277. The computer program product of claim 276
15 wherein said program code when executed on said
computer is operable to identify subsequent related
data contained in said outbound data transmitted by
said application and said inbound data received by said
20 application after the completion of a transaction, and
control the computer to store said subsequent related
data in the data repository with said transaction data
already identified.

278. The computer program product of claim 277
25 wherein said program code when executed on said
computer is operable to identify said subsequent
related data by identifying common indicators in both
said transaction data already identified and said
30 outbound data transmitted by said application and said
inbound data received by said application after the
completion of a transaction has been identified,
said common indicators being one or more of
the address of the location to which said outbound data
35 is transmitted or from which said inbound data is
received, part of the data path to the location to
which said outbound data is transmitted or from which

said inbound data is received, account code or reference numbers.

279. The computer program product of claim 262
5 wherein said application is operable such that a user
of said application can indicate said outbound and said
inbound data that is related to a transaction, said
program code when executed on said computer being
operable to identify said outbound and said inbound
10 data so indicated.

280. The computer program product of claim 262
wherein said program code when executed on said
computer is operable to control the computer to store
15 all of said outbound data and said inbound data in
memory as previous data, irrespective of whether it may
or may not be part of a transaction and, to retrieve a
pre-determined amount of previous data from said
outbound data and said inbound data stored in memory if
20 the existence of a transaction is identified, and to
control the computer to store said previous data in the
data repository with said transaction data.

281. The computer program product of claim 280
25 wherein said rules of said policy data specify the
amount of previous data that is to be retrieved in
dependence on the indicator by which the existence of a
transaction is identified.

30 282. The computer program product of claim 280
wherein said public network is the Internet and said
application is a web browser, said web browser being
operable to store each web page that is viewed by said
web browser in memory as previous data.

35 283. The computer program product of claim 282
wherein said rules of said policy data specify the
number of web pages that are to be retrieved from those

previously stored in memory in dependence on the indicator by which the existence of a transaction is identified.

5 284. The computer program product of claim 262
wherein said program code when executed on said
computer is further operable to control the computer to
store all of said outbound data and said inbound data
in memory as previous data, irrespective of whether it
10 may or may not be part of a transaction and, to
identify, in said previous data, earlier relevant data
that is related to said transaction data already
identified, and control the computer to store the
earlier relevant data in the data repository with said
15 transaction data.

285. The computer program product of claim 284
wherein said program code when executed on said
computer is further operable to identify said earlier
20 relevant data in said previous data, by identifying
common indicators in both said transaction data and
said previous data, said common indicators being one or
more of the address of the location to which said
outbound data is transmitted or from which said inbound
25 data is received, part of the data path to the location
to which said outbound data is transmitted or said
inbound data is received, account codes or reference
numbers.

30 286. The computer program product of claim 262
wherein said program code when executed on said
computer is further operable to control the computer to
store all of said outbound data and said inbound data
in memory as previous data, irrespective of whether it
35 may or may not be part of a transaction; and

 wherein said computer program product
further comprises a selector, recorded on said
recording medium, said selector being operable to

select earlier relevant data from said previous data in response to input from a user,

and wherein said program code when executed on said computer is further operable to control the
5 computer to store said earlier relevant data selected by the user in said data repository together with said transaction data.

287. The computer program product of claim 262
10 wherein said program code when executed on said computer is operable, once the existence of a transaction has been identified, to determine the nature of said transaction by analysing the content of said outbound and inbound data,

15 said rules of said policy data defining how said transaction data is to be stored in said data repository in dependence on the nature of the transaction that has been determined, said transaction data being stored in said database according to said
20 determination and said rules of said policy data.

288. The computer program product of claim 287
wherein said program code when executed on said computer is further operable to determine the nature of
25 the transaction by identifying in said outbound data and said inbound data one or more indicators, said indicators being defined in said rules of said policy data, and being one or more of: the address of the public network location to which said data that may be
30 part of a transaction is transmitted or from which it is received; part of the data path to the public network location to which said transaction data is transmitted or from which it is received; account codes; reference numbers; credit card numbers; digital
35 certificates and pre-determined keywords.

289. The computer program product of claim 262 wherein said program code when executed on said

computer is further operable, once the existence of a transaction has been identified, to identify one or more indicators of the nature of said transaction, and to control the computer to organise the storage of said transaction data by said one or more indicators such that it forms a record.

290. The computer program product of claim 289 wherein said rules of said policy data define said one or more indicators of the nature of a transaction, said indicators being one or more of: the address of the public location to which said transaction data is transmitted or from which it is received; part of the data path to the public location to which said transaction data is transmitted or from which it is received; account codes, reference numbers, credit card numbers, digital certificates and pre-determined keywords.

291. The computer program product of claim 262 wherein the data repository is accessible by one or more of an accounts application, an order processing application or other transaction management application.

292. The computer program product of claim 262 wherein said program code when executed on said computer is further operable to cause any identified relevant data to be encrypted before it is stored in said data repository.

293. The computer program product of claim 262 wherein said program code when executed on said computer is further operable to cause any relevant data stored in the data repository to be encrypted.

294. The computer program product of claim 262 wherein said program code is executable at each of said computers.

5 295. The computer program product of claim 262 wherein said application is a web browser.

296. The computer program product of claim 295 wherein said program code when executed on said
10 computer is a plug-in module of said web browser.

297. The computer program product of claim 296 wherein said web browser is Microsoft's Internet Explorer and said plug-in module is a Browser Helper
15 Object.

298. The computer program product of claim 262 wherein said application is an e-mail client.

20 299. The computer program product of claim 298 wherein said program code when executed on said computer is a plug-in module of said e-mail client.

300. The computer program product of claim 299
25 wherein said e-mail client is Microsoft's Outlook e-mail client and said plug-in module is a Microsoft Exchange client extension.

301. Computer program product of claim 262 wherein
30 said network includes a server and said program code is executable at a point on said network intermediate said one or more workstations and said server, or said program code is executable at said server.

35 302. The computer program product of claim 262 further comprising program code recorded on the recording medium which when executed on a computer in the plurality of computers enable that computer as a

supervisor workstation, said supervisor workstation having access to said data repository and being operable to view said relevant data stored in said data repository.

5

303. The computer program product of claim 302 wherein said policy data is accessible by said supervisor workstation, such that a user of said supervisor workstation can edit said policy data.

10

304. An information management system comprising:
one or more workstations adapted for
connection to a computer network, each workstation having a memory;

15

an application stored in said memory of each workstation for transmitting outbound data to said network and receiving inbound data from said network;

20

policy data, containing rules for the transmission of outbound data that may be part of a transaction; and

25

an analyser, said analyser being operable in conjunction with said policy data to identify in at least said outbound data, transaction data that may be part of a transaction, and to make a determination in accordance with said rules of said policy data as to whether the transmission of said transaction data would satisfy said rules;

30

and wherein the transmission of said transaction data by said application is dependent on said determination made by said analyser.

305. The system of claim 304, wherein according to said determination made by said analyser, said transaction data is either, transmitted, not transmitted, or sent to an approver who determines whether or not to transmit the transaction data.

35

306. The system of claim 305 further comprising:

one or more approvers, for deciding whether the transmission of said data that may be part of a transaction may be made;

wherein said analyser is operable to identify
5 in said data that may be part of a transaction, data that needs approval and to refer said data that needs approval to one of said one or more approvers; and

the transmission of said data that needs approval being dependent on the decision of said one or
10 more approver.

307. The system of claim 306 wherein said analyser is operable to identify said transaction data that needs approval by determining the nature of said
15 transaction data and by checking said rules of said policy data, said rules of said policy data defining whether or not approval is needed in dependence on the determined nature of said transaction data.

308. The system of claim 306 wherein said analyser is operable to determine the nature of said transaction data by identifying at least one of the identity of the transmitter of said data, the identity of the intended recipient of said data, the workstation from which said
25 data is to be transmitted, the sum for which a transaction is to be made, and the account against which a transaction is to be made.

309. The system of claim 306 wherein said analyser
30 is operable to determine the nature of said transaction data that needs approval and to select said one of said one or more approvers in dependence on that determination.

310. The system of claim 309 wherein said analyser
35 is operable to determine the nature of said transaction data that needs approval by identifying at least one of the identity of the transmitter of said data, the

identity of the intended recipient of said data, the work station from which said data is to be transmitted, the sum for which a transaction is to be made, and the account against which the transaction is to be made.

5

311. The system of claim 304 wherein said analyser is operable to determine whether a secure link has been negotiated between said application and a remote site on said network, and to identify said outbound data or
10 said inbound data as transaction data, if it is transmitted on a secure link.

312. The system of claim 311 wherein said network is the Internet, and said rules of said policy data
15 define the addresses of web sites or e-mail accounts that negotiate secure links for the transmission of data but which are known not to be eCommerce sites or accounts, said analyser being operable to disregard said outbound data transmitted to those web sites or
20 accounts or said inbound data received from those web sites or accounts, such that no approval is required.

313. The system of claim 304 wherein said analyser is operable to identify transaction data by reference
25 to said rules of said policy data, said rules of said policy data defining the addresses of known eCommerce web sites and e-mail accounts.

314. The system of claim 304 wherein said analyser
30 is operable to identify credit card numbers in said outbound data or said inbound data, and to identify outbound data or inbound data that contains a credit card number as transaction data.

35 315. The system of claim 314 wherein said policy data specifies pre-determined credit card numbers that can never be transmitted.

316. The system of claim 304 wherein said analyser
is operable to identify transaction data by reference
to said rules of said policy data, said rules of said
policy data defining one or more of pre-determined
5 digital certificates, account codes, pre-determined
keywords, pre-determined names and addresses and
embedded codes.

317. The system of claim 304 wherein said analyser
10 is operable to identify embedded codes in said inbound
data, said embedded codes having been placed in said
inbound data to mark said inbound data as transaction
data.

318. The system of claim 304 wherein said
15 application is operable such that a user of said
application can indicate said outbound and said inbound
data that is part of a transaction, said analyser being
operable to identify said outbound and said inbound
20 data so indicated.

319. The system of claim 304 wherein said analyser
is located on each of said one or more workstations.

320. The system of claim 304 wherein said
25 application is a web browser.

321. The system of claim 320 wherein said analyser
is a plug-in module of said web browser.

30 322. The system of claim 321 wherein said web
browser is Microsoft's Internet Explorer and said
analyser is a Browser Helper Object.

35 323. The system of claim 304 wherein said
application is an e-mail client.

324. The system of claim 323 wherein said analyser is a plug-in module of said e-mail client.

325. The system of claim 324 wherein said e-mail
5 client is Microsoft's Outlook e-mail client and said analyser is a Microsoft Exchange client extension.

326. The system of claim 304 wherein said network
10 comprises a server and said analyser is located at a point on said network intermediate said one or more workstations and said server, or said analyser is located at said server.

327. The system of claim 304 wherein said computer
15 network to which said one or more workstations are adapted for connection is a public computer network, and wherein said one or more workstations together form a private computer network.

328. The system of claim 304 further comprising a
20 supervisor workstation, said policy data being accessible by said supervisor workstation, such that a user of said supervisor workstation can edit said policy data.

25 329. A method for managing information comprising the steps of:

providing one or more workstations adapted
for connection to a computer network, each workstation
30 having a memory;

providing an application stored in said
memory of each workstation for transmitting outbound
data to said network and receiving inbound data from
said network;

35 providing policy data, containing rules for the transmission of outbound data that may be part of a transaction; and

analysing at least said outbound data to identify, with reference to said rule of said policy data, transaction data that may be part of a transaction;

5 determining, in accordance with said rules of said policy data, whether the transmission of said transaction data would satisfy said rules;

 controlling transmission of said transaction data by said application in dependence on the
10 determination made in said determining step.

330. The method of claim 329, wherein said controlling step includes said transaction data being either, transmitted, not transmitted, or sent to an
15 approver who determines whether or not to transmit the transaction data.

331. The method of claim 330 further comprising the steps of:

20 identifying in said data that may be part of a transaction, data that needs approval;

 referring said data that need approval to one or more approvers for approval; and

 monitoring whether or nor approval is
25 received from said one or more approvers;

 and wherein in said controlling step, the transmission of said transaction data depends on whether or not approval is received from said one or more approvers.

30

332. The method of claim 331 wherein said analysing step includes identifying said transaction data that needs approval by determining the nature of said transaction data and checking said rules of said
35 policy data, said rules of said policy data defining whether or not approval is needed in dependence on the determined nature of said transaction data.

333. The method of claim 331 wherein said
analysing step includes determining the nature of said
transaction data by identifying at least one of the
identity of the transmitter of said data, the identity
5 of the intended recipient of said data, the workstation
from which said data is to be transmitted, the sum for
which a transaction is to be made, and the account from
which a transaction is to be made.

10 334. The method of claim 331 wherein said
analysing step includes determining the nature of said
transaction data that needs approval and selecting said
one of said one or more approvers in dependence on that
determination.

15 335. The method of claim 334 wherein said
analysing step includes determining the nature of said
transaction data that needs approval by identifying at
least one of the identity of the transmitter of said
20 data, the identity of the intended recipient of said
data, the work station from which said data is to be
transmitted, the sum for which a transaction is to be
made, and the account from which the transaction is to
be made.

25 336. The method of claim 329 wherein said
analysing step includes determining whether a secure
link has been negotiated between said application and a
remote site on said network, and identifying said
30 outbound data or said inbound data as transaction data,
if it is transmitted on a secure link.

337. The method of claim 336 wherein said network
is the Internet, and said rules of said policy data
35 define the addresses of web sites or e-mail accounts
that negotiate secure links for the transmission of
data but which are known not to be eCommerce sites or
accounts, and said analysing step includes disregarding

said outbound data transmitted to those web sites or accounts or said inbound data received from those web sites or accounts, such that no approval is required.

5 338. The method of claim 329 wherein said analysing step includes identifying transaction data by reference to said rules of said policy data, said rules of said policy data defining the addresses of known eCommerce web sites and e-mail accounts.

10

 339. The method of claim 329 wherein said analysing step includes identifying credit card numbers in said outbound data or said inbound data, and identifying outbound data or inbound data that contains
15 a credit card number as transaction data.

 340. The method of claim 339 wherein said policy data specifies pre-determined credit card numbers that can never be transmitted.

20

 341. The method of claim 329 wherein said analysing step includes identifying transaction data by reference to said rules of said policy data, said rules of said policy data defining one or more of pre-
25 determined digital certificates, account codes, pre-determined keywords, pre-determined names and addresses and embedded codes.

 342. The method of claim 329 wherein said
30 analysing step includes detecting an embedded code in said inbound data, said embedded code having been placed in said inbound data to mark said inbound data as transaction data.

35 343. The method of claim 329 further comprising the step of providing a user of said application with a selector to indicate said outbound and said inbound data that is part of a transaction, said analysing step

2025 RELEASE UNDER E.O. 14176

including identifying selected outbound and inbound data.

344. The method of claim 329 wherein said
5 analysing step is performed at said one or more
workstations.

345. The method of claim 329 wherein said
application is a web browser.

10

346. The method of claim 345 wherein said
analysing step is a plug-in module of said web browser.

347. The method of claim 346 wherein said web
15 browser is Microsoft's Internet Explorer and said
plug0in module is a Browser Helper Object.

348. The method of claim 329 wherein said
application is an e-mail client.

20

349. The method of claim 348 wherein said
analysing step is performed by a plug-in module of said
e-mail client.

350. The method of claim 349 wherein said e-mail
25 client is Microsoft's Outlook e-mail client and said
analyser is a Microsoft Exchange client extension.

351. The method of claim 329 wherein said network
30 comprises a server and said analyser is located at a
point on said network intermediate said one or more
workstations and said server, or said analyser is
located at said server.

352. The method of claim 329 wherein said computer
35 network to which said one or more workstations are
adapted for connection is a public computer network,

and wherein said one or more workstations together form a private computer network.

353. The method of claim 329 further comprising
5 the step of providing a supervisor workstation, said policy data being accessible by said supervisor workstation, such that a user of said supervisor workstation can edit said policy data.

10 354. A computer program product, for controlling a computer to manage information, said computer being connected to a public network and having access to policy data containing rules for the transmission to the public network of outbound data that may be part of
15 a transaction, comprising:

a recording medium readable by the computer, having program code recorded thereon which when executed on said computer configures the computer to:

20 analyse, in conjunction with an application running on the computer that is operable to transmit outbound data to the public network and receive inbound data from the public network, at least said outbound data to identify, with reference to said rules of said policy data, transaction data that may be part of a
25 transaction to determine, in accordance with said rules of said policy data, whether the transmission of said transaction data would satisfy said rules; and

30 to control the computer to control the transmission of said transaction data by said application in dependence on the determination made by said analyser.

35 355. The computer program product of claim 354 wherein said program code when executed on said computer is operable to control the computer such that said transaction data is either, transmitted, not transmitted, or sent to an approver who determines whether or not to transmit the transaction data.

356. The computer program product of claim 355 wherein the program code when executed on said computer is further operable to identify in said data that may
5 be part of a transaction, data that needs approval; refer said data that needs approval to one or more approvers for approval, and monitor whether or not approval is received from said one or more approvers;
and wherein the transmission of said
10 transaction data by said application depends on whether or not approval is received from said one or more approvers;

357. The computer program product of claim 356
15 wherein said program code when executed on said computer is further operable to identify said transaction data that needs approval by determining the nature of said transaction data and checking said rules of said policy data, said rules of said policy data
20 defining whether or not approval is needed in dependence on the determined nature of said transaction data.

358. The computer program product of claim 356
25 wherein said program code when executed on said computer is further operable to determine the nature of said transaction data by identifying at least one of the identity of the transmitter of said data, the identity of the intended recipient of said data, the
30 computer in the private network from which said data is to be transmitted, the sum for which a transaction is to be made, and the account from which a transaction is to be made.

35 359. The computer program product of claim 356 wherein said program code when executed on said computer is further operable to determine the nature of said transaction data that needs approval and select

said one of said one or more approvers in dependence on that determination.

360. The computer program product of claim 359
5 wherein said program code when executed on said
computer is operable to determine the nature of said
transaction data that needs approval by identifying at
least one of the identity of the transmitter of said
data, the identity of the intended recipient of said
10 data, the computer in the private network from which
said data is to be transmitted, the sum for which a
transaction is to be made, and the account from which
the transaction is to be made.

361. The computer program product of claim 354
15 wherein said program code when executed on said
computer is operable to determine whether a secure link
has been negotiated between said application and a
remote site on said public network, and to identify
20 said outbound data or said inbound data as transaction
data, if it is transmitted on a secure link.

362. The computer program product of claim 361
wherein said public network is the Internet, and said
25 rules of said policy data define the addresses of web
sites or e-mail accounts that negotiate secure links
for the transmission of data but which are known not to
be eCommerce sites or accounts, and said program code
when executed on said computer is operable to disregard
30 said outbound data transmitted to those web sites or
accounts or said inbound data received from those web
sites or accounts, such that no approval is required.

363. The computer program product of claim 354
35 wherein said program code when executed on said
computer is operable to identify transaction data by
reference to said rules of said policy data, said rules

of said policy data defining the addresses of known eCommerce web sites and the e-mail accounts.

364. The computer program product of claim 354
5 wherein said program code when executed on said
computer is operable to identify credit card numbers in
said outbound data or said inbound data, and to
identify outbound data or inbound data that contains a
credit card number as transaction data.

10

365. The computer program product of claim 364
wherein said policy data specifies pre-determined
credit card numbers that can never be transmitted.

15 366. The computer program product of claim 354
wherein said program code when executed on said
computer is operable to identify transaction data by
reference to said rules of said policy data, said rules
of said policy data defining one or more of pre-
20 determined digital certificates, account codes, pre-
determined keywords, pre-determined names and addresses
and embedded codes.

367. The computer program product of claim 354
25 wherein said program code when executed on said
computer is operable to detect an embedded code in said
inbound data, said embedded code having been placed in
said inbound data to mark said inbound data as
transaction data.

30

368. The computer program product of claim 354
further comprising, a selector, recorded on said
recording medium, said selector being operable to
select data in said outbound and said inbound data that
35 is part of a transaction in response to input from a
user, said program code when executed on said computer
being operable to identify said outbound and said
inbound data so selected.

369. The computer program product of claim 354 wherein said program code is executable at said computer.

5

370. The computer program product of claim 354 wherein said application is a web browser.

371. The computer program product of claim 370 wherein said program code when executed on said computer is a plug-in module of said web browser.

372. The computer program product of claim 371 wherein said web browser is Microsoft's Internet Explorer and said plug-in module is a Browser Helper Object.

373. The computer program product of claim 354 wherein said application is an e-mail client.

20

374. The computer program product of claim 373 wherein said program code when executed on said computer is a plug-in module of said e-mail client.

375. The computer program product of claim 374 wherein said e-mail client is Microsoft's Outlook e-mail client and said plug-in module is a Microsoft Exchange client extension.

376. The computer program product of claim 354 wherein said public network includes a server and said program code is executable at a point on said network intermediate said computer and said server, or said program code is executable at said server.

35

377. An information management system comprising:

one or more workstations adapted for connection to a computer network, each workstation having a memory;

an application stored in said memory of each
5 workstation for receiving at least inbound data from said network;

an analyser, said analyser being operable in conjunction with said application to monitor said inbound data and to identify in at least said inbound
10 data, signed data that has been digitally signed with a digital certificate, to extract one or more details of said signed data and to determine whether or not verification is required for said digital certificate;

policy data, accessible by said analyser,
15 containing rules which define whether or not verification is required for said digital certificate;

and wherein said analyser determines whether or not verification is required for said digital certificate in dependence on said rules of said policy
20 data and in dependence on said one or more details of said signed data extracted by said analyser.

378. The system of claim 377 wherein said verification for said digital certificate includes
25 determining whether said digital certificate has been revoked.

379. The system of claim 378 wherein said analyser is further operable to determine whether said signed
30 data is part of an eCommerce transaction, and if it is, to determine the amount of money that is promised in that eCommerce transaction,

wherein said verification for the digital certificate also includes determining whether said
35 digital certificate can be taken as a guarantee of receiving the amount of money promised in said eCommerce transaction.

380. The system of claim 377 wherein said analyser
is operable to extract as one or more details of said
signed data, one or more of said digital certificate
holder's identity, the expiry date of said digital
5 certificate, the issue number of said digital
certificate, and the domain name from which the signed
data was received, and wherein said rules of said
policy file define whether or not verification for said
digital certificate is required in dependence on the
10 one or more details extracted by said analyser.

381. The system of claim 377 wherein said analyser
is operable to determine whether or not an eCommerce
transaction is occurring, and to extract, as one or
15 more details of said signed data, the amount of any
transaction being made with said digital certificate,
the account code from which any payment is being made,
a credit card number, one or more indicators of the
nature of the transaction, and wherein said rules of
20 said policy file define whether or not verification is
required for a digital certificate in dependence on the
one or more details extracted by said analyser.

382. The system of claim 381 further comprising a
25 data repository in which, digital certificates used to
digitally sign any previously received signed data or
sufficient decriptive data to identify any such digital
certificates, and transaction data describing any
previous transactions made with those digital
30 certificates are stored,

said transaction data being at least one or
more of the date of any previous transactions made with
a digital certificate, and the amount of any previous
transaction made with that digital certificate,
35 and wherein said rules of said policy file
define whether or not verification for said digital
certificate is required in dependence on said
transaction data.

383. The system of claim 377 further comprising a data repository, accessible by said analyser, wherein said analyser is operable to identify any digital
5 certificates that are used to digitally sign signed data in at least said inbound data, and to cause any such digital certificates, or sufficient descriptive data to identify such digital certificates to be stored in said data repository.

10

384. The system of claim 383 wherein said analyser is operable, to record the results of any verification for an digital certificate in said data repository together with said digital certificate or together with
15 said descriptive data.

385. The system of claim 384 wherein said analyser is operable, if it identifies a digital certificate in said inbound data, to determine whether said digital
20 certificate has been previously stored in said data repository, or whether said descriptive information identifying said digital certificate has been stored in said data repository, and if said digital certificate has been previously stored, to look-up the results of
25 any previous verification of whether said digital certificate has been revoked, wherein said analyser determines whether or not to verify if said digital certificate has been revoked in dependence on said results of any previous verification of whether said
30 identified digital certificate has been revoked.

386. The system of claim 377 wherein said analyser is further operable to verify whether or not a digital certificate has been revoked, and wherein said
35 application is operable to prevent said inbound data being viewed by a user of said application if said analyser determines that said digital certificate has been revoked.

387. The system of claim 377 wherein said analyser
is further operable to verify whether or not a digital
certificate has been revoked, and said application is
5 operable to notify a user of said application that said
inbound data is not to be relied upon if said analyser
determines that said digital certificate has been
revoked.

10 388. The system of claim 377 wherein said analyser
is located on each of said one or more workstations.

389. The system of claim 377 wherein said
application is a web browser.

15 390. The system of claim 389 wherein said analyser
is a plug-in module of said web browser.

391. The system of claim 390 wherein said web
20 browser is Microsoft's Internet Explorer and said
analyser is a Browser Helper Object.

392. The system of claim 377 wherein said
application is an e-mail client.

25 393. The system of claim 392 wherein said analyser
is a plug-in module of said e-mail client.

394. The system of claim 393 wherein said e-mail
30 client is Microsoft's Outlook e-mail client and said
analyser is a Microsoft client extension.

395. The system of 377 wherein said network
comprises a server, and said analyser is located at a
35 point on said network intermediate said one or more
workstations and said server, or said analyser is
located at said server.

396. The system of claim 377 wherein said computer network to which said one or more workstations are adapted for connection is a public computer network, and wherein said one or more workstations together form
5 a private computer network.

397. The system of claim 377 further comprising a supervisor workstation, said policy data being accessible by said supervisor workstation, such that a
10 user of said supervisor workstation can edit said policy data.

398. A method of managing information comprising the steps of:
15 providing one or more workstations adapted for connection to a computer network, each workstation having a memory;
providing an application stored in said memory of each workstation for receiving at least
20 inbound data from said network;
providing policy data, containing rules which define whether or not verification is required for a digital certificates used to digitally sign signed data received in said inbound data;
25 identifying in at least said inbound data, signed data that has been digitally signed with a digital certificate;
extracting one or more details of said signed data; and
30 determining whether or not verification is required for said digital certificate in dependence on said rules of said policy data and in dependence on said one or more details of said signed data extracted in said extracting step.

35
399. The method of claim 398 wherein said verification for the digital certificate includes

determining whether the digital certificate has been revoked.

400. The method of claim 399 further comprising
5 the step of determining whether said signed data is
part of an eCommerce transaction, and if it is,
determining the amount of money that is promised in
that eCommerce transaction,

wherein said verification for the digital
10 certificate also includes determining whether said
digital certificate can be taken as a guarantee of
receiving the amount of money promised in said
eCommerce transaction.

401. The method of claim 398 wherein said one or
15 more details of said signed data extracted in said
extracting step, include one or more of said digital
certificate holder's identity, the expiry date of said
digital certificate, the issue number of said digital
20 certificate, and the domain name from which the signed
data was received, and wherein said rules of said
policy file define whether or not verification for said
digital certificate is required in dependence on the
one or more details.

25
402. The method of claim 398 further comprising
the step of determining whether or not an eCommerce
transaction is occurring, and if it is, extracting in
said extracting step, as one or more details of said
30 inbound data, the amount of any transaction being made
with said digital certificate, the account code from
which any payment is being made, a credit card number,
one or more indicators of the nature of the
transaction, and wherein said rules of said policy file
35 define whether or not verification is required for a
digital certificate in dependence on said one or more
details.

403. The method of claim 402 further comprising the step of providing a data repository in which digital certificates used to digitally sign any previously received signed data or sufficient
5 descriptive data to identify any such digital certificates, and transaction data describing any previous transactions made with those digital certificates are stored;

said transaction data being at least one or
10 more of the date of any transactions made with a digital certificate, and the amount of any transaction made with that digital certificate,

and wherein said rules of said policy file define whether or not verification for said digital
15 certificate is required in dependence on said transaction data.

404. The method of claim 398 further comprising the steps of identifying digital certificates used to
20 sign signed data in said inbound data or digital certificates transmitted in said inbound data and storing said digital certificates or sufficient descriptive data to identify said digital certificates in said data repository.

25 405. The method of claim 404 further comprising the steps of recording the results of any verification for an digital certificate in said data repository together with said digital certificate.

30 406. The method of claim 405 further comprising the step of determining whether said digital certificate has been previously stored in said data repository, and if it has been previously stored, to
35 look-up the results of any previous verification for said digital certificate,

wherein said step of determining whether or not verification is required for said digital

certificate is dependent on said results of any previous verification for said digital certificate.

407. The method of claim 398 further comprising
5 the steps of determining whether or not a digital
certificate has been revoked, and preventing said
inbound data being viewed by a user of said application
if said identified digital certificate has been
revoked.

10

408. The method of claim 398 further comprising
the steps of determining whether or not a digital
certificate has been revoked, and notifying a user of
said application that said inbound data is not to be
15 relied upon if said digital certificate has been
revoked.

409. The method of claim 398 wherein said steps of
identifying a digital certificate, extracting one or
20 more details from said signed data and determining
whether or not verification is required are performed
at said one or more workstations.

410. The method of claim 398 wherein said
25 application is a web browser.

411. The method of claim 410 wherein said steps of
identifying a digital certificate, extracting one or
more details from said signed data and determining
30 whether or not verification is required are performed
by a plug-in module of said web browser.

412. The method of claim 411 wherein said web
browser is Microsoft's Internet Explorer and said plug-
35 in module is a Browser Helper Object.

413. The method of claim 398 wherein said
application is an e-mail client.

414. The method of claim 413 wherein said steps of identifying a digital certificate, extracting one or more details from said signed data and determining
5 whether or not verification is required are performed by a plug-in module of said e-mail client.

415. The method of claim 416 wherein said e-mail client is Microsoft's Outlook e-mail client and said
10 plug-in module is a Microsoft Exchange client extension.

416. The method of claim 398 wherein said network comprises a server, and said steps of identifying a
15 digital certificate, extracting one or more details from said signed data and determining whether or not verification is required are performed at a point on said network intermediate said one or more workstations and said server, or said steps of identifying a digital
20 certificate, extracting one or more details from said signed data and determining whether or not verification is required are performed at said server.

417. The method of claim 398 wherein said computer
25 network to which said one or more workstations are adapted for connection is a public computer network, and wherein said one or more workstations together form a private computer network.

30 418. The method of claim 398 further comprising providing a supervisor workstation, said policy data being accessible by said supervisor workstation, such that a user of said supervisor workstation can edit said policy data.

35

419. A computer program product for controlling a computer connected to a public network to manage information, said computer having access to policy data

containing rules which define whether or not verification is required for a digital certificate used to digitally sign signed data received in inbound data from the public network,

5 comprising:

a recordable medium readable by the computer, having program code recorded thereon which when executed on said computer configures said computer to:

analyse, in conjunction with an application
10 running on the computer that is operable to receive at least inbound data from the public network, signed data that has been digitally signed with a digital certificate, to extract one or more details of said signed data;

15 to determine whether or not verification is required for said digital certificate in dependence on said rules of said policy data and in dependence on the one or more extracted details of said signed data; and

to control the application in dependence on
20 the determination.

420. The computer program product of claim 419 wherein said verification for the digital certificate includes determining whether the digital certificate
25 has been revoked.

421. The computer program product of claim 420 wherein said program code when executed on said computer is further operable to determine whether said
30 signed data is part of an eCommerce transaction, and if it is, to determine the amount of money that is promised in that eCommerce transaction,

wherein said verification for the digital certificate also includes determining whether said
35 digital certificate can be taken as a guarantee of receiving the amount of money promised in said eCommerce transaction.

422. The computer program product of claim 419 wherein said one or more details of said signed data, include one or more of said digital certificate holder's identity, the expiry date of said digital
5 certificate, the issue number of said digital certificate, and the domain name from which the signed data was received, and wherein said rules of said policy file define whether or not verification for said digital certificate is required in dependence on the
10 one or more details.

423. The computer program product of claim 419 wherein said program code when executed on said computer is further operable to determine whether or
15 not an eCommerce transaction is occurring, and if it is, to extract as one or more details of said signed data, the amount of any transaction being made with said digital certificate, the account code from which any payment is being made, a credit card number, one or
20 more indicators of the nature of the transaction, and wherein said rules of said policy file define whether or not verification is required for said digital certificate in dependence on said one or more details.

424. The computer program product of claim 423 wherein the program code when executed on said computer is further operable to control the computer to record digital certificates used to digitally sign any signed data received in said inbound data or sufficient
30 descriptive data to identify any such digital certificates, and transaction data describing any transactions made with those digital certificates in a data repository such that a record is maintained of transactions made with a digital certificate;

35 said transaction data being at least one or more of the date of any transactions made with a digital certificate, and the amount of any transaction made with that digital certificate,

and wherein said rules of said policy file define whether or not verification for said digital certificate is required in dependence on said transaction data.

5

425. The computer program product of claim 419 wherein said program code when executed on said computer is further operable to control the computer to store digital certificates used to sign signed data in
10 said inbound data or digital certificates transmitted in said inbound data and storing said digital certificates or sufficient descriptive data to identify said digital certificates in a data repository.

15

426. The computer program product of claim 425 wherein said program code when executed on said computer is further operable control the computer to record the results of any verification for an identified digital certificate in said data repository
20 together with said identified digital certificate.

427. The computer program product of claim 426 wherein said program code when executed on said computer is operable to determine whether said
25 identified digital certificate has been previously stored in said data repository, and if it has been previously stored, to look-up the results of any previous verification for said identified digital certificate,

30

wherein the determination of whether or not verification is required for said identified digital certificate is dependent on said results of any previous verification for said identified digital certificate.

35

428. The computer program product of claim 419 wherein said program code when executed on said computer is operable to determine whether or not a

digital certificate has been revoked, and control said application to prevent said inbound data being viewed by a user of said application if said identified digital certificate has been revoked.

5

429. The computer program product of claim 419 wherein said program code when executed on said computer is operable to determine whether or not a digital certificate has been revoked, and to control
10 said application to notify a user of said application that said inbound data is not to be relied upon if said identified digital certificate has been revoked.

430. The computer program product of claim 419
15 wherein said program code is executable at said computer.

431. The computer program product of claim 419 wherein said application is a web browser.
20

432. The computer program product of claim 431 wherein said program code when executed on said computer is a plug-in module of said web browser.

433. The computer program product of claim 432 wherein said web browser is Microsoft's Internet Explorer and said plug-in module is a Browser Helper Object.
25

434. The computer program product of claim 419 wherein said application is an e-mail client.
30

435. The computer program product of claim 434 wherein said program code when executed on said
35 computer is a plug-in module of said e-mail client.

436. The computer program product of claim 435 wherein said e-mail client is Microsoft's Outlook e-

mail client and said plug-in module is a Microsoft Exchange client extension.

437. The computer program product of claim 419
5 wherein said network includes a server and said program code is executable at a point on said network intermediate said computer and said server, or said program code is executable at said server.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1020
1021
1022
1023
1024
1025
1026
1027
1028
1029
1030
1031
1032
1033
1034
1035
1036
1037
1038
1039
1040
1041
1042
1043
1044
1045
1046
1047
1048
1049
1050
1051
1052
1053
1054
1055
1056
1057
1058
1059
1060
1061
1062
1063
1064
1065
1066
1067
1068
1069
1070
1071
1072
1073
1074
1075
1076
1077
1078
1079
1080
1081
1082
1083
1084
1085
1086
1087
1088
1089
1090
1091
1092
1093
1094
1095
1096
1097
1098
1099
1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1110
1111
1112
1113
1114
1115
1116
1117
1118
1119
1120
1121
1122
1123
1124
1125
1126
1127
1128
1129
1130
1131
1132
1133
1134
1135
1136
1137
1138
1139
1140
1141
1142
1143
1144
1145
1146
1147
1148
1149
1150
1151
1152
1153
1154
1155
1156
1157
1158
1159
1160
1161
1162
1163
1164
1165
1166
1167
1168
1169
1170
1171
1172
1173
1174
1175
1176
1177
1178
1179
1180
1181
1182
1183
1184
1185
1186
1187
1188
1189
1190
1191
1192
1193
1194
1195
1196
1197
1198
1199
1200
1201
1202
1203
1204
1205
1206
1207
1208
1209
1210
1211
1212
1213
1214
1215
1216
1217
1218
1219
1220
1221
1222
1223
1224
1225
1226
1227
1228
1229
1230
1231
1232
1233
1234
1235
1236
1237
1238
1239
1240
1241
1242
1243
1244
1245
1246
1247
1248
1249
1250
1251
1252
1253
1254
1255
1256
1257
1258
1259
1260
1261
1262
1263
1264
1265
1266
1267
1268
1269
1270
1271
1272
1273
1274
1275
1276
1277
1278
1279
1280
1281
1282
1283
1284
1285
1286
1287
1288
1289
1290
1291
1292
1293
1294
1295
1296
1297
1298
1299
1300
1301
1302
1303
1304
1305
1306
1307
1308
1309
1310
1311
1312
1313
1314
1315
1316
1317
1318
1319
1320
1321
1322
1323
1324
1325
1326
1327
1328
1329
1330
1331
1332
1333
1334
1335
1336
1337
1338
1339
1340
1341
1342
1343
1344
1345
1346
1347
1348
1349
1350
1351
1352
1353
1354
1355
1356
1357
1358
1359
1360
1361
1362
1363
1364
1365
1366
1367
1368
1369
1370
1371
1372
1373
1374
1375
1376
1377
1378
1379
1380
1381
1382
1383
1384
1385
1386
1387
1388
1389
1390
1391
1392
1393
1394
1395
1396
1397
1398
1399
1400
1401
1402
1403
1404
1405
1406
1407
1408
1409
1410
1411
1412
1413
1414
1415
1416
1417
1418
1419
1420
1421
1422
1423
1424
1425
1426
1427
1428
1429
1430
1431
1432
1433
1434
1435
1436
1437
1438
1439
1440
1441
1442
1443
1444
1445
1446
1447
1448
1449
1450
1451
1452
1453
1454
1455
1456
1457
1458
1459
1460
1461
1462
1463
1464
1465
1466
1467
1468
1469
1470
1471
1472
1473
1474
1475
1476
1477
1478
1479
1480
1481
1482
1483
1484
1485
1486
1487
1488
1489
1490
1491
1492
1493
1494
1495
1496
1497
1498
1499
1500
1501
1502
1503
1504
1505
1506
1507
1508
1509
1510
1511
1512
1513
1514
1515
1516
1517
1518
1519
1520
1521
1522
1523
1524
1525
1526
1527
1528
1529
1530
1531
1532
1533
1534
1535
1536
1537
1538
1539
1540
1541
1542
1543
1544
1545
1546
1547
1548
1549
1550
1551
1552
1553
1554
1555
1556
1557
1558
1559
1560
1561
1562
1563
1564
1565
1566
1567
1568
1569
1570
1571
1572
1573
1574
1575
1576
1577
1578
1579
1580
1581
1582
1583
1584
1585
1586
1587
1588
1589
1590
1591
1592
1593
1594
1595
1596
1597
1598
1599
1600
1601
1602
1603
1604
1605
1606
1607
1608
1609
1610
1611
1612
1613
1614
1615
1616
1617
1618
1619
1620
1621
1622
1623
1624
1625
1626
1627
1628
1629
1630
1631
1632
1633
1634
1635
1636
1637
1638
1639
1640
1641
1642
1643
1644
1645
1646
1647
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
1669
1670
1671
1672
1673
1674
1675
1676
1677
1678
1679
1680
1681
1682
1683
1684
1685
1686
1687
1688
1689
1690
1691
1692
1693
1694
1695
1696
1697
1698
1699
1700
1701
1702
1703
1704
1705
1706
1707
1708
1709
1710
1711
1712
1713
1714
1715
1716
1717
1718
1719
1720
1721
1722
1723
1724
1725
1726
1727
1728
1729
1730
1731
1732
1733
1734
1735
1736
1737
1738
1739
1740
1741
1742
1743
1744
1745
1746
1747
1748
1749
1750
1751
1752
1753
1754
1755
1756
1757
1758
1759
1760
1761
1762
1763
1764
1765
1766
1767
1768
1769
1770
1771
1772
1773
1774
1775
1776
1777
1778
1779
1780
1781
1782
1783
1784
1785
1786
1787
1788
1789
1790
1791
1792
1793
1794
1795
1796
1797
1798
1799
1800
1801
1802
1803
1804
1805
1806
1807
1808
1809
1810
1811
1812
1813
1814
1815
1816
1817
1818
1819
1820
1821
1822
1823
1824
1825
1826
1827
1828
1829
1830
1831
1832
1833
1834
1835
1836
1837
1838
1839
1840
1841
1842
1843
1844
1845
1846
1847
1848
1849
1850
1851
1852
1853
1854
1855
1856
1857
1858
1859
1860
1861
1862
1863
1864
1865
1866
1867
1868
1869
1870
1871
1872
1873
1874
1875
1876
1877
1878
1879
1880
1881
1882
1883
1884
1885
1886
1887
1888
1889
1890
1891
1892
1893
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2060
2061
2062
2063
2064
2065
2066
2067
2068
2069
2070
2071
2072
2073
2074
2075
2076
2077
2078
2079
2080
2081
2082
2083
2084
2085
2086
2087
2088
2089
2090
2091
2092
2093
2094
2095
2096
2097
2098
2099
2100
2101
2102
2103
2104
2105
2106
2107
2108
2109
2110
2111
2112
2113
2114
2115
2116
2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
2160
2161
2162
2163
2164
2165
2166
2167
2168
2169
2170
2171
2172
2173
2174
2175
2176
2177
2178
2179
2180
2181
2182
2183
2184
2185
2186
2187
2188
2189
2190
2191
2192
2193
2194
2195
2196
2197
2198
2199
2200
2201
2202
2203
2204
2205
2206
2207
2208
2209
2210
2211
2212
2213
2214
2215
2216